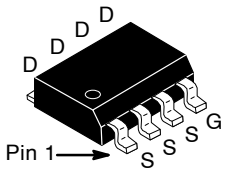
MOSFET – N-Channel, POWERTRENCH®

40 V

FDS4672A

V_{DSS}	$R_{DS(on)}$	I_D MAX
40 V	13 mΩ @ 4.5 V	11 A



SOIC8
CASE 751EB

General Description

This N-Channel MOSFET has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

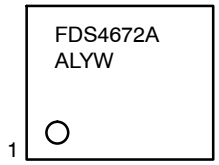
Features

- 11 A, 40 V. $R_{DS(ON)}$ = 13.0 mΩ @ V_{GS} = 4.5 V
- High Performance Trench Technology for Extremely Low $R_{DS(on)}$
- Low Gate Charge (35 nC Typical)
- High Power and Current Handling Capability
- This Device is Pb-Free, Halide Free and is RoHS Compliant

Applications

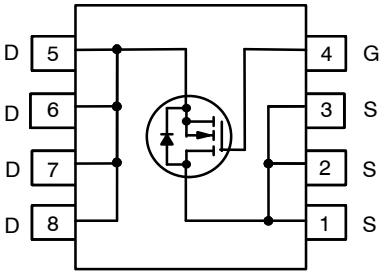
- DC/DC Converter

MARKING DIAGRAM



FDS4672A = Specific Device Code
A = Assembly Site
L = Wafer Lot Number
YW = Assembly Start Week

PIN CONNECTIONS



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

Symbol	Parameter	Ratings	Unit
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	±12	V
I_D	Drain Current – Continuous (Note 1a) – Pulsed	 11 50	A
E_{AS}	Single Pulse Avalanche Energy (Note 3)	181	mJ
P_D	Power Dissipation for Single Operation (Note 1a) (Note 1b) (Note 1c)	 2.5 1.4 1.2	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	−55 to +175	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Symbol	Parameter	Ratings	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1a)	50	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 1)	25	

ORDERING INFORMATION

Device	Package	Shipping†
FDS4672A	SOIC8	2500 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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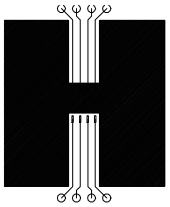
ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

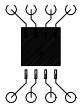
Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
BV_{DSS}	Drain to Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V	40			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, Referenced to 25 °C		37		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 32 V, V_{GS} = 0 V			1	μA
I_{GSSF}	Gate-Body Leakage, Forward	V_{GS} = 12 V, V_{DS} = 0 V			100	nA
I_{GSSR}	Gate-Body Leakage, Reverse	V_{GS} = −12 V, V_{DS} = 0 V			−100	nA
ON CHARACTERISTICS (Note 2)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 μA	0.8	1.2	2.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	I_D = 250 μA, Referenced to 25 °C		−4		mV/°C
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 4.5 V, I_D = 11 A		10	13	mΩ
		V_{GS} = 4.5 V, I_D = 11 A, T_J = 125 °C		15	21	
$I_{D(on)}$	On-State Drain Current	V_{GS} = 4.5 V, V_{DS} = 5 V	50			A
g_{FS}	Forward Transconductance	V_{DS} = 5 V, I_D = 11 A		65		S
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	V_{DS} = 20 V, V_{GS} = 0 V, f = 1.0 MHz		4766		pF
C_{oss}	Output Capacitance			346		pF
C_{rss}	Reverse Transfer Capacitance			155		pF
SWITCHING CHARACTERISTICS (Note 2)						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 20 V, I_D = 1 A, V_{GS} = 4.5 V, R_{GEN} = 6 Ω		17	31	ns
t_r	Turn-On Rise Time			9	18	ns
$t_{d(off)}$	Turn-Off Delay Time			43	68	ns
t_f	Turn-Off Fall Time			14	25	ns
Q_g	Total Gate Charge	V_{DS} = 20 V, I_D = 11 A, V_{GS} = 4.5 V		35	49	nC
Q_{gs}	Gate-Source Charge			7.8		nC
Q_{gd}	Gate-Drain Charge			8.8		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I_S	Maximum Continuous Drain–Source Diode Forward Current				2.1	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 2.1 A (Note 2)		0.7	1.2	V

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

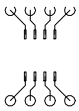
1. $R_{\theta JA}$ is determined with the device mounted on a 1 in^2 pad 2 oz copper pad on a 1.5 × 1.5 in. board of FR-4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



a.) 50 °C/W when mounted on a 1 in^2 pad of 2 oz copper.



b) 105 °C/W when mounted on a .04 in^2 pad of 2 oz copper.



c) 125 °C/W when mounted on a minimum pad.

2. Pulse Test: Pulse Width < 300 μs, Duty cycle < 2.0 %.
3. Starting T_J = 25 °C, L = 3 mH, I_D = 11 A, V_{DD} = 40 V, V_{GS} = 10 V.

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TYPICAL CHARACTERISTICS

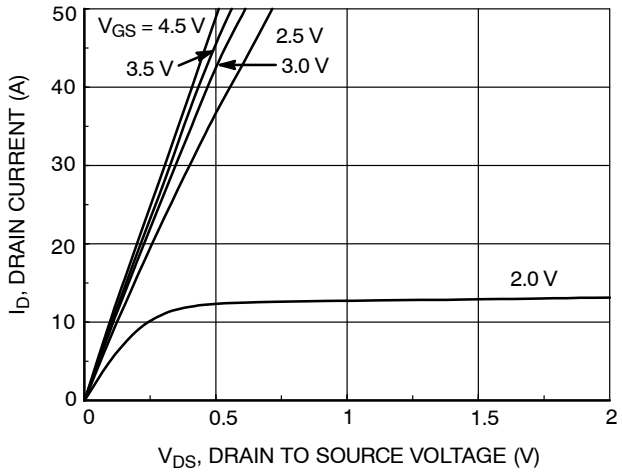

Figure 1. On-Region Characteristics

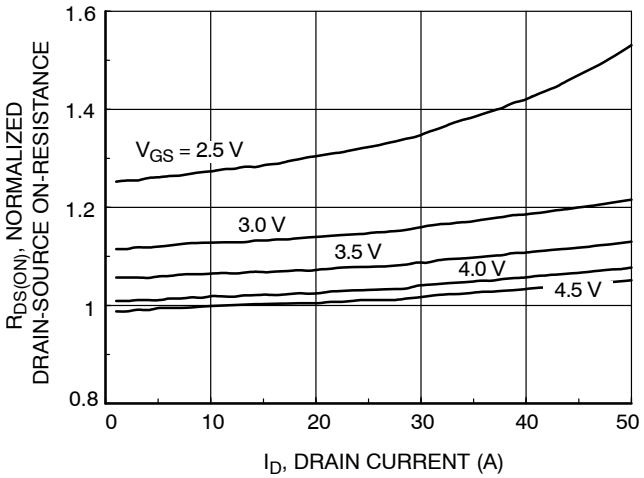

Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

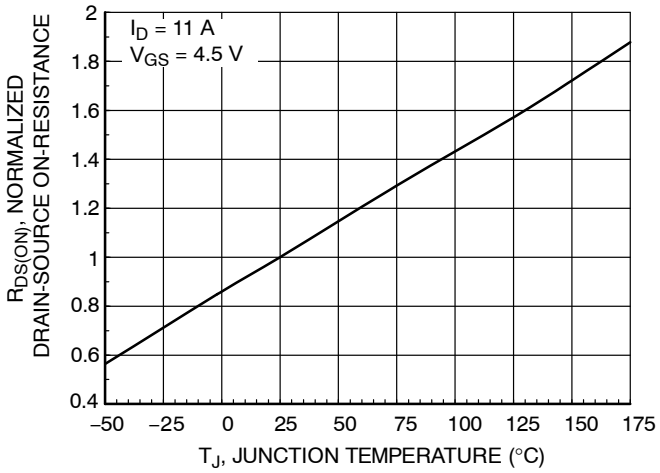

Figure 3. On-Resistance Variation with Temperature

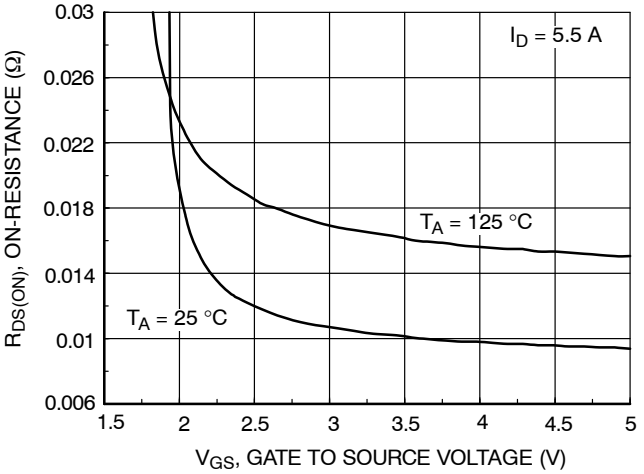

Figure 4. On-Resistance Variation with Gate-to-Source Voltage

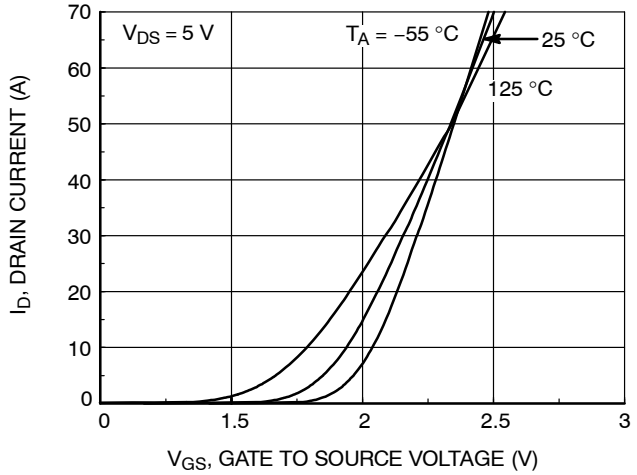

Figure 5. Transfer Characteristics

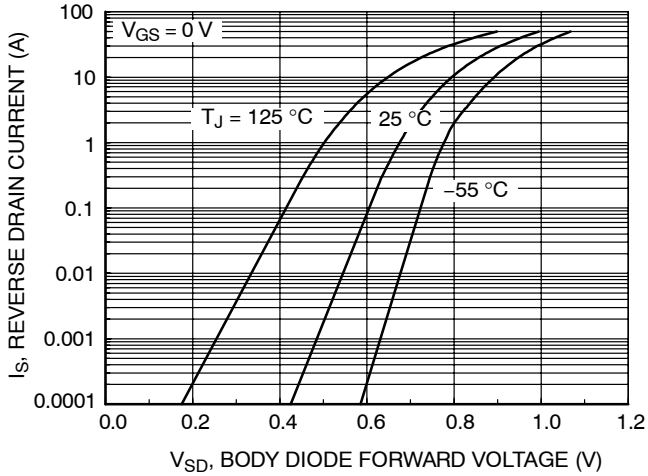

Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

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TYPICAL CHARACTERISTICS (continued)

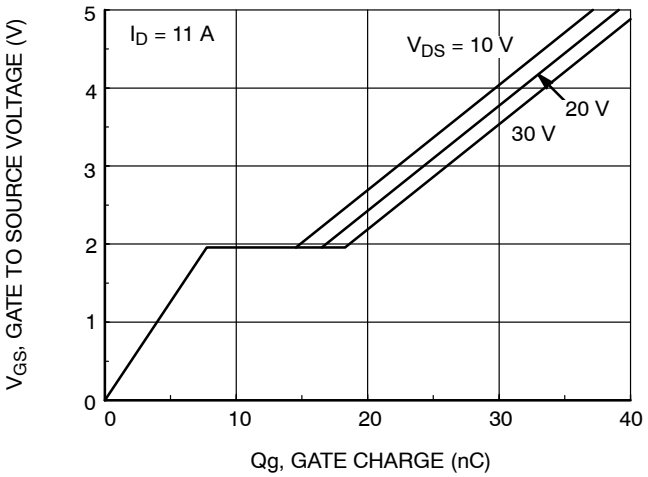

Figure 7. Gate Charge Characteristics

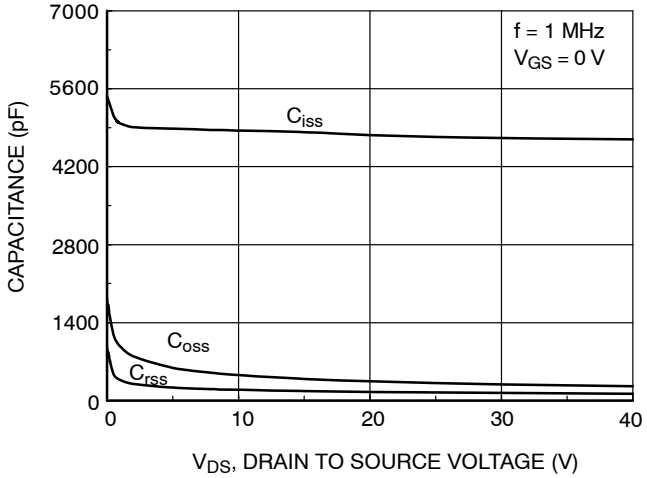

Figure 8. Capacitance Characteristics

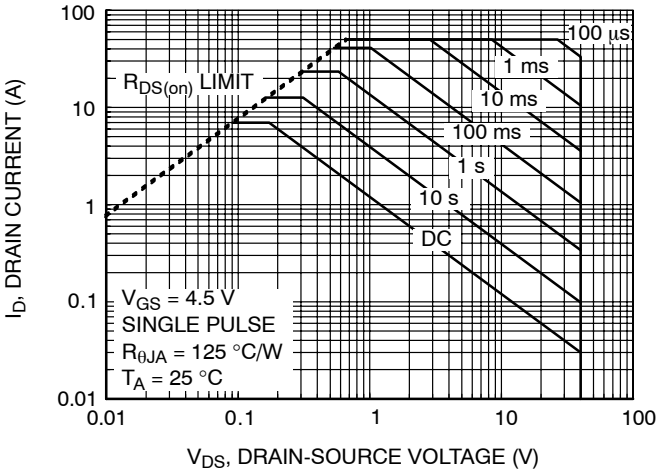

Figure 9. Maximum Safe Operating Area

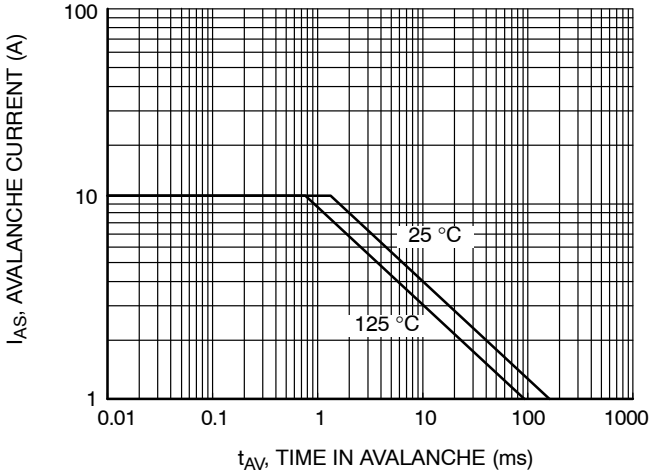

Figure 10. Unclamped Inductive Switching Capability

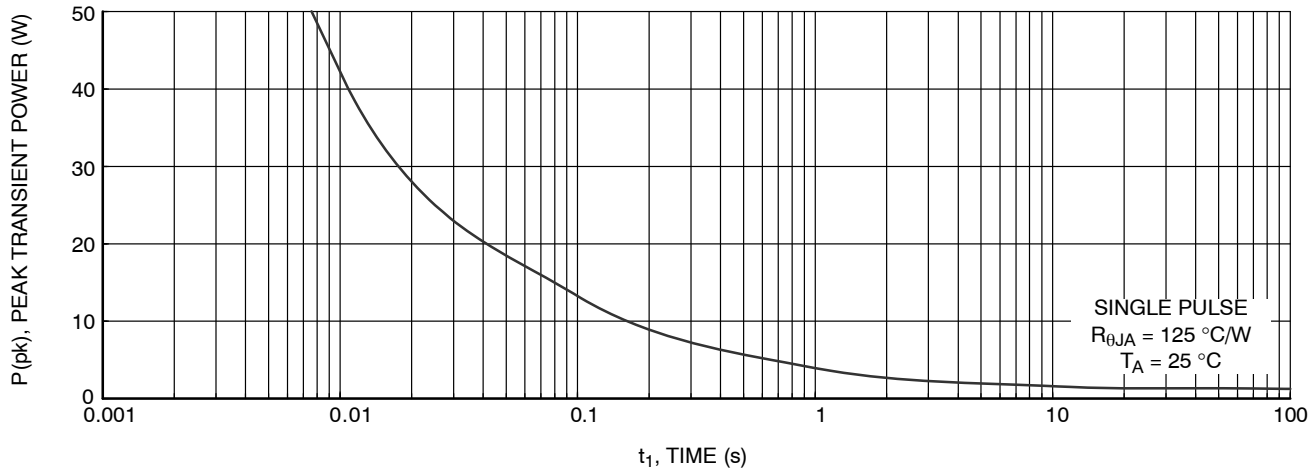

Figure 11. Single Pulse Maximum Power Dissipation

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TYPICAL CHARACTERISTICS (continued)

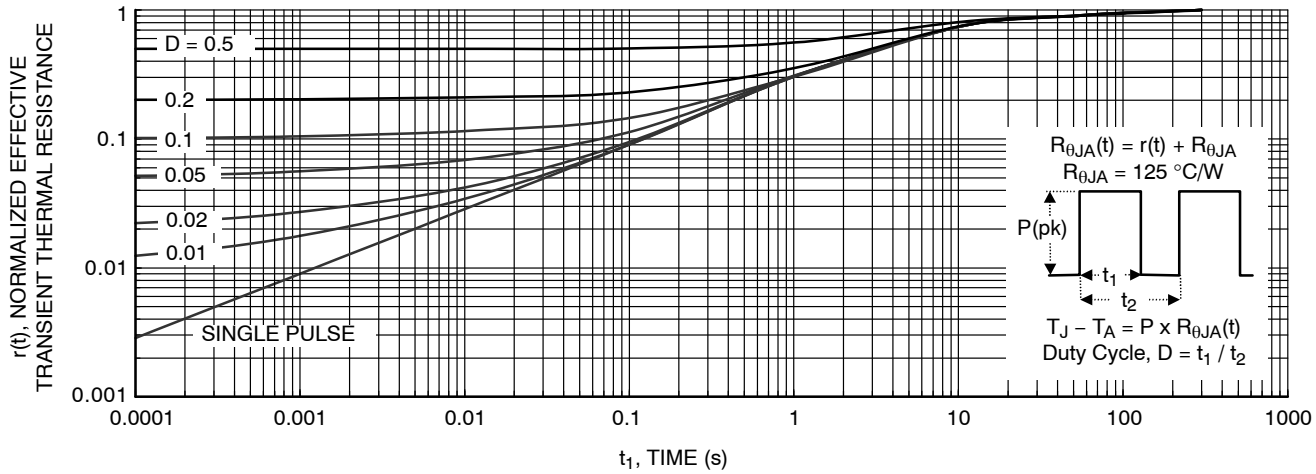

Figure 12. Transient Thermal Response Curve

Thermal characterization performed using the conditions described in Note 1c.
Transient thermal response will change depending on the circuit board design.

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REVISION HISTORY

Revision	Description of Changes	Date
3	Document converted to **onsemi** format.	8/19/2026

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

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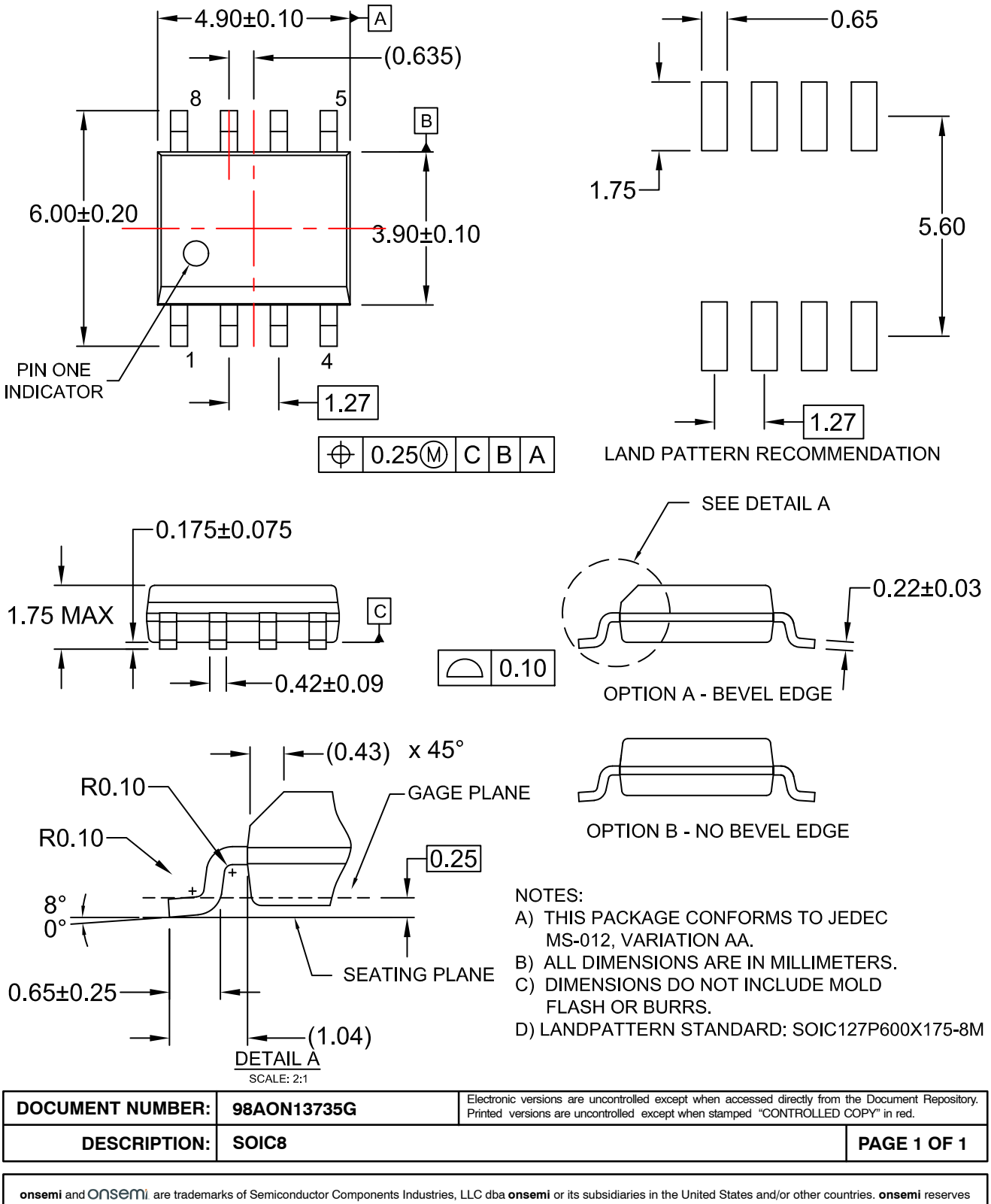
SOIC8
CASE 751EB
ISSUE A

DATE 24 AUG 2017



NOTES:
A) THIS PACKAGE CONFORMS TO JEDEC MS-012, VARIATION AA.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
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